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Consumer Stigma and the Reputation Trap Hypothesis: An In-Store Experiment with Colorado Wines

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Abstract

We conducted an in-store experiment to test the hypothesis that Colorado wines may suffer from reputational stigma. The context relates to marketing challenges faced by novel wine regions entering the competitive retail environment, even in a local context, and the possibility of being stuck in a "bad reputation trap." Adopting a 2×2 design where we varied region of production (Colorado vs. California) and grape variety (familiar vs. unfamiliar), we administered a between-subject information treatment that revealed the origin of production to only half of the participants. We measured taste perceptions using Likert scales, and we elicited valuation via a multiple price listing. Our results are consistent with the presence of stigma against wines produced in Colorado. In the discussion, we draw from the literature on stigmatized markets to suggest plausible strategies to remove or avoid stigma. (JEL Classifications: L1, L15, Q1, Q13)

Keywords: collective reputation, local wine marketing, novel wine regions, stigma.

I. Introduction

Wine and grapevine production occur in every state in the United States, with a total of 242 recognized American Viticultural Areas (AVA) scattered across the country

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(TTBGov, 2019). While California remains the uncontested leader, with 86% of production by volume (Wines Vines Analytics, 2019), virtually all continental U.S. states have established local wine industries. The essential pull factor behind the expansion of wine-making into nontraditional regions has been consumer demand for agritourism experiences (Franken, Gómez, and Ross, 2018), with 30 million annual wineries visits supporting a labor force of more than 50,000 (WineAmerica.Org., 2014). Government policies leveraging wine production to support rural economies have also played a fundamental role (Clark and Jablonski, 2018), with three major thrusts: (1) a legislative shift towards a simpler regulatory and fiscal environment for alcohol production (Lee and Gartner, 2015); (2) an extensive effort to both develop grape varieties better suited to suboptimal growing conditions and improve quality (e.g., the Northern Grape Project[1] for cold climates, see Lee and Gartner (2015)); and (3) state branding and marketing campaigns supporting local agricultural products (Nganje, Hughner, and Lee, 2011).[2]

The crucial remaining question is whether burgeoning wine regions (e.g., Colorado, Virginia, Texas, New Jersey, Missouri, Wisconsin) will remain a localized phenomenon linked to tourism and entertainment or if an expansion into the mature U.S. wine market is both possible and advisable. In order to grow, regional wineries would have to move past on-premises sales and enter the large-scale distribution network based on the three-tier system (producer, distributor, and retailer, see Beliveau and Rouse (2010)). According to some producers (Edquist, 2014), consumers' entrenched, negative quality perceptions are the biggest obstacle to this expansion. As wine is an experience good (Nelson, 1974), a logical strategy to improve reputation would be to focus on continuous quality control. The assumption is that quality will reveal itself over time as more and more consumers are introduced to the new wines.

One problem is that quality control alone may be insufficient. If negative attitudes have a stigma or stereotype-like traits, and wines of similar tasting quality are deemed inferior only because of their origin, changing perceptions will require strategic and concerted effort (see Slade Shantz et al., 2018). When purchasing outside of a tasting room, consumers can only rely on extrinsic quality cues (Steenkamp, 1990), which makes regional information much more salient, especially to high-involvement consumers (Lockshin et al., 2006). Stigma may therefore turn away first-time buyers before real quality can be revealed. Engrained expectations, positive or negative, can also alter the neural processes related to sensory experiences (Plassmann et al., 2008), biasing taste perceptions and reinforcing self-fulfilling stereotypes. Novel wine regions may therefore be stuck in a *bad reputation trap*, whereby negative perceptions slow or halt progress regardless of quality improvements.

[1] https://northerngrapesproject.org/

[2] Examples include "Go Texas," "California Grown," "Arizona Grown," "Fresh from Florida," "Pride of North Dakota," and "Colorado Proud." Currently, each of the U.S. states has established its own branding logo.

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In this article, we present the results of two field experiments conducted in Colorado urban liquor stores to examine the presence of stigma against wines produced in the state. Our experiments followed a 2×2 design where we varied the region of production (Colorado vs. California) and grape variety (common vs. recently introduced). We presented grape variety names to all participants, while a between-subject information treatment revealed production origin (i.e., the state but not the AVA) to only half of the sample. We measured taste perceptions using Likert scales, and we elicited valuation via a multiple price listing auction (Andersen et al., 2006). While a few studies have investigated the effect of expectations on taste perceptions (e.g., Wansink, Payne, and North, 2007; Veale and Quester, 2008), we are not aware of any such experiment conducted in a retail shopping environment and considering both taste perceptions and willingness to pay (WTP).

Colorado has many traits common to other nontraditional wine regions. Even though the first winemaking operations in Colorado were established more than a century ago (Loureiro, 2003), post-prohibition production did not resume until the 1970s. In 1990, the Colorado legislature passed the Colorado Wine Industry Development Act, which established both a checkoff program on all wine sales and the Colorado Wine Industry Development Board (CWIDB)[3] within the Colorado Department of Agriculture (CDA). The CWIDB supported the nascent industry through marketing efforts and research on cold-resistant grape varieties.[4] In 1999, the CDA started the Colorado Proud program, which created a state-branded logo promoting local agricultural products. Our focus on state branding is a result of the funding mechanism, which mandates the promotion and support of *all* wineries in Colorado rather than specific AVAs. Furthermore, this type of state-centered promotional effort is common to other emerging wine regions (e.g., see Canziani and Byrd (2017), in the case of North Carolina).

While these efforts have encouraged industry growth, overall market share remains small (around 2% of wine sold in Colorado by volume, with 5% of value according to industry statistics[5]), with most sales occurring on-premises rather than through the three-tier distribution system. Recent survey evidence (Christenson et al., 2016) from a representative sample revealed that only 8% of Coloradoans (vs. 26% and 23% for fruits and vegetables, respectively) would buy more Colorado wine if it were state-branded, suggesting a stigmatized reputation. In sum, Colorado provides a prototypical case study of a growing wine industry at a crossroads.

[3] See https://coloradowine.com/wp-content/uploads/CWIDB-MediaKit_2011.pdf.
[4] See, for example, NE1720: Multi-State Coordinated Evaluation of Winegrape Cultivars and Clones.
[5] https://coloradowine.com/wp-content/uploads/2017/09/CO-wine-prod-and-mkt-share-Sept-2019.pdf

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II. Relevant Literature

The game-theoretic literature (Shapiro, 1982) has conceptualized reputation as an *ex-ante* expectation useful in guiding consumer choice when quality is not directly observable (i.e., asymmetric information). The idea that a "bad reputation trap" may damage some wine regions was raised previously by Castriota and Delmastro (2015),[6] based on the empirical observation that viticultural areas with poor reputations (as measured by wine critics' assessments) displayed low upward mobility over 30 years. However, a poor reputation can be well deserved, and it is not necessarily synonymous with stigma (Mishina and Devers, 2012). A key difference between reputation and stigma is that stigma tends to be sticky and difficult to remove because it relates to inferences made about some underlying, fundamental characteristic (Goffman, 1968). In the context of our experiments, we operationalize this idea by noting that, absent stigma, information about a region of production should have no effect when "true" quality is revealed through the tasting.

However, substantive literature has examined the effect of intrinsic and extrinsic quality cues on taste perceptions, and the current consensus is that reliance on extrinsic cues, such as the region of production, survives and interacts with product experience (e.g., Veale and Quester, 2009). Even more relevant to our work, stigma-like behavior against nontraditional wine regions has been previously documented. For example, Wansink, Payne, and North (2007) find that informing attendants at a University of Illinois dining event that the wine served was from North Dakota lowered quality ratings. Lee et al. (2018) conducted a study in a Hong Kong hotel with Chinese consumers, and novice drinkers stigmatized wines from Iowa, Wisconsin, Germany, and Argentina, but no effect was found with more experienced consumers.

While these studies are certainly relevant from a consumer behavior perspective, the information is not immediately useful to Iowa or Wisconsin wineries, as they are unlikely to enter the international wine market. Arguably, the first step in expanding beyond direct sales is to enter the local regional market.[7] Our interest here is to examine whether stigmatizing behavior can be detected with local consumers and in a typical retail setting. Along similar lines, some researchers have studied how novel wine regions could amend poor reputations. Loureiro (2003) considered local messaging and environmentally friendly practices, finding that neither is an

[6] It is worth noting that the idea that groups of actors may be stigmatized well after an original sin has long been at the center of the labor discrimination literature (Coate and Loury, 1993). The literature on stigmatized markets is also quite relevant (e.g., Goffman, 1968), but for brevity, we keep the focus on the food and beverage literature.

[7] Entering the international wine market involves establishing distribution contracts with large-scale wholesalers. According to the Wine Institute, 90% of the wine exported from the United States comes from California. Entering the local distribution chain is simpler. Anecdotally, the store owners we interacted with stated a willingness to devote shelf space to Colorado wineries to support the local community, even though they may have had more lucrative options.

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effective tool to boost WTP for Colorado wines. Rickard, McCluskey, and Patterson (2015) tested the use of "reputation tapping," such as associating wine from a burgeoning U.S. wine region (Virginia) with more established French viticultural areas to increase acceptance. They found a modest positive effect, but the practice may infringe on intellectual property legislation and the Trade-Related Aspects of Intellectual Property Rights (TRIPS) WTO rulings.

The perspective we take here is that ascertaining the presence of stigmatizing behavior in the target consumer population is pivotal when devising an appropriate marketing strategy because eliminating stigma necessitates more than a simple focus on improving quality. The contribution of this article is twofold. First, we conduct a test of stigmatized quality perceptions for Colorado wines. Second, we use our results to inform a marketing strategy, drawing from the existing literature on stigmatized markets.

III. Data Collection and Experimental Design

We conducted two experimental sessions in liquor stores located in two Northern Colorado cities (Fort Collins and Boulder) during the summer of 2015. Both the Fort Collins and Boulder stores are proximate to university campus locations. The Fort Collins store is 25,000 square feet, offers a wide selection of beer, wine, and spirits, and is located in a commercial area next to a Whole Foods Market. The Boulder store is 32,500 square feet and also offers beer, wine, and liquor, but it anecdotally serves a more diverse clientele. Both stores offer weekly tasting events in situ, and we conducted the experiments during such events. We intercepted shoppers in the stores and recruited them to participate in a tasting experiment, with the incentive of a chance to earn prize money. Customers who agreed to participate received a tablet providing step-by-step directions in the form of a Qualtrics survey. Once informed consent was given, participants responded to a series of demographic (age, gender, family income) and wine-shopping behavior questions. Then, participants stated their level of familiarity with a number of grape varieties and U.S. wine regions.

Once the wine knowledge survey was completed, participants approached the counter to begin the experimental component of the interaction, which started by rolling a die to randomly determine the amount of compensation, either $8 or $12. This randomization provides an exogenous instrument in case the compensation amount might influence bids (see Carlsson, He, and Martinsson (2013) on the effect of windfall money on charitable donations). Next, we presented participants with four wines to taste. The design followed a simple 2×2 structure, where the region of production (Colorado vs. California) and grape variety (common vs. uncommon) varied (see Table 1).

Due to legal constraints, only wines purchased by each store through the three-tier distribution system could be served for tasting and sold in the experiment, so we selected wines from offerings of the stores' distributors and in consultation with CWIDB executives. While we followed the same experimental design for the two experiments, it was not possible to serve the same wines in the two locations. Wine store employees poured

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Table 1
Experimental Design

	Fort Collins Location	
	California	*Colorado*
Known varietal	Merlot (t = 1)	Merlot (t = 2)
Unknown varietal	Valdiguiè (t = 3)	Chambourcin (t = 4)
	Boulder Location	
	California	*Colorado*
Known varietal	Cabernet (t = 4)	Cabernet (t = 3)
Unknown varietal	Carignane (t = 2)	Chambourcin (t = 1)

(t=#) indicates tasting order.

four wines (1 oz./sample) for each participant, serving them in the order reported in Table 1, which CWIDB staff suggested as ideal, and offering crackers between each sample to cleanse the palate. While randomization of the order may seem desirable from an experimental point of view, it was both logistically challenging (Colorado law requires that only trained store employees serve the wine) and undesirable from a sensory point of view, as serving wines in an improper order (e.g., from sweeter to drier) will alter the tasting experience (O'Mahony and Goldstein, 1986).

The main advantage of conducting the experiments inside a liquor store is that one can be sure to sample from the relevant consumer population, rather than a convenience sample from university staff. Another important factor is that participants' choices occur in a context-rich environment rather than a sterile lab, and they may be more representative of real behavior (Gneezy, 2016). Such advantages, however, come at the cost of a more limited ability to manipulate the experiment.

During the experiment, we kept all wine bottles in brown bags, and the only information available to participants was a numbered label in front of each wine (1–4). The delivery of the information treatment followed a between-subject design: Participants beginning the experiment during the first half of the data collection day received information about the grape variety only, whereas we communicated both variety and region of production during the second half of the day. While within-subject designs with the sequential release of information have obvious advantages (i.e., participants act as their own control, as in Hayes et al. (1995)), this type of design is hard to implement outside of a laboratory environment. Our main constraint was concluding each experiment in a reasonable amount of time to avoid congesting the stores with long lines.

During the tasting experience, participants used the tablets to evaluate each wine in terms of "appearance," "aroma/bouquet," "taste/texture," "aftertaste," and "overall acceptability" on a scale from 1 (dislike extremely) to 5 (like extremely), with 3 indicating indifference (neither like nor dislike). Once the tasting was

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concluded, participants began the auction component of the experiment. We elicited valuation for each wine using a multiple price listing (MPL) auction (Kahneman, Knetsch, and Thaler, 1990). This instrument has the advantage of being relatively rapid and simple to explain. We presented participants with a series of ordered prices in a table and then asked them to state if they would be willing to pay the listed price (yes/no). In our case, the table included the four tasted wines (in as many columns) and six listed prices (in as many rows). One downside of this approach is that valuation is elicited in intervals, and the choice of boundaries can induce framing effects (Andersen et al., 2006). To mitigate this issue, we randomly assigned participants to one of two different price list intervals ($4.99, $9.99, $14.99, $10.99, $24.99, $29.99 or $2.99, $7.99, $11.99, $14.99, $24.99, $29.99).

Once participants filled the multiple price table with an array of yes/no answers, they randomly drew a product (i.e., column) and a price (i.e., row) to identify the binding product and price. If participants stated they would be willing to pay a particular price for a product (answer = yes), then they were asked to buy the product at the stated price through the store's cashier. If the coupon provided exceeded the drawn price, participants could use the extra money to purchase other items. If we recorded a "no" answer at that price, the experiment ended, and participants could use the entire value of the coupon towards the purchase of any other item in the store. This mechanism ensured that the auction is incentive compatible; that is, it is in participants' best interests to report their true WTP for a product. Regardless of the outcome of each auction, participants were free to use their incentive coupons on any items sold in the store.

IV. Models, Hypotheses Tested, and Estimators

The models we estimate take the form:

$$y_{ij} = \sum_{j=1}^{j=8} \beta_{0j}(\text{Wine}_{ij}) + \sum_{j=1}^{j=8} \beta_{1j}(\text{Wine}_{ij}^{*}\ \text{InfoTreat}_{i}) + \varepsilon_{ij}, \tag{1}$$

where the dependent variable y_{ij} is either the overall tasting score or the maximum WTP interval assigned by participant i to wine j. β_{0j} is a set of $j = 1, \ldots, 8$ intercepts specific to each wine-experimental location pair (see Table 1), InfoTreat_i is an indicator variable equal to one if the region of origin (information treatment) was presented during the experiment, and ε_{ij} is the disturbance term. Thus, the wine-location intercepts β_{0j} measure the average tasting scores/valuations, while the β_{1j} coefficients measure how average tastings/valuations change when regional information is present.

We also estimate a simpler specification obtained by modifying the right-hand side of Model (1) into:

$$y_{ij} = \sum_{j=1}^{j=8} \beta_{0j}(\text{Wine}_{ij}) + \beta_1^{CO}(\text{CO}_{ij}^{*}\ \text{InfoTreat}_{i}) + \beta_1^{CA}(\text{CA}_{ij}^{*}\ \text{InfoTreat}_{i}) + \varepsilon_{ij}, \tag{2}$$

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where CO_{ij} and CA_{ij} are dummy variables indicating wines produced in Colorado and California, respectively, so that β_1^{CO} and β_1^{CA} capture the average effect of the information treatment for the wines produced in each region, rather than for each wine.

Given the nature of the data, Models (1) and (2) can be easily estimated via OLS with the tasting score data (which vary continuously from 1 to 5), while the interval nature of the WTP bids suggest the use of interval regression,[8] a likelihood-based estimation approach. In both models, we assume that the disturbance ε_{ij} is not correlated between participants (i.e., $\text{cov}(\varepsilon_{ij}, \varepsilon_{kl}) = 0$ for $i \neq k$ irrespective of the wine), but scores and WTP bids of a given individual may be correlated across wines (i.e., $\text{cov}(\varepsilon_{ij}, \varepsilon_{kl}) \neq 0$ for $i = k$ and $j \neq l$), possibly as a result of ordering effects. This error structure requires the adoption of cluster-robust estimators of the variance-covariance matrix.

Testing the stigma hypothesis using the results from Model (1) implies four (one for each Colorado wine) one-sided tests in the form:

$$\begin{cases} H_0: \beta_{1j} \geq 0 & \text{There Is No Evidence of Stigma} \\ H_A: \beta_{1j} < 0 & \text{There Is Evidence of Stigma} \end{cases}$$

or, using Model (2), a single "joint" test in the form:

$$\begin{cases} H_0: \beta_1^{CO} \geq 0 & \text{There Is No Evidence of Stigma} \\ H_A: \beta_1^{CO} < 0 & \text{There Is Evidence of Stigma} \end{cases}$$

V. Results

A. Descriptive Statistics

We conducted the experiments on two separate days in the summer of 2015 in two liquor stores in Colorado, one located in Fort Collins (N = 150) and one located in Boulder (N = 172). Descriptive statistics (Table 2) show that roughly half of the participants were female, and the Fort Collins sample had higher reported income and age than the Boulder sample. In each location, slightly more than half of the participants received the information treatment. Differences in mean demographics between the subpopulations (treated vs. untreated) are generally small in magnitude, but mean household income and gender (t = 5.94, p = 0.00 and t= −2.66, p = 0.01) are statistically significant, while age and wine consumption habits are not (t = 0.90, p = 0.37, and t= −0.40, p = 0.69).

A majority of participants (73%) declared that they consumed wine at least once a week, so participants are reflective of the target consumer population. In our sample,

[8] We used the "intreg" command in STATA 15.

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Table 2
Descriptive Statistics

		Household Income	*Female*	*Age*	*Wine Freq.*
Fort Collins	Mean	4.09	0.53	3.38	2.47
N = 150	S.D.	(1.52)	(.5)	(1.21)	(1.44)
Boulder	Mean	2.8	0.44	2.27	2.88
N = 172	S.D.	(1.89)	(.5)	(1.21)	(1.3)
Untreated	Mean	3.74	0.44	2.82	2.67
N = 142	S.D.	(1.89)	(.5)	(1.34)	(1.37)
Treated	Mean	3.13	0.51	2.76	2.70
N = 180	S.D.	(1.76)	(.5)	(1.32)	(1.4)
Wine drinkers	Mean	3.63	0.50	3.02	—
N = 236	S.D.	(1.83)	(.5)	(1.31)	
Nondrinkers	Mean	2.78	0.42	2.15	—
N = 86	S.D.	(1.72)	(.49)	(1.18)	

Notes: Household Income brackets in US$. 1: [≤$25,000]; 2: [25,001; 49,999]; 3: [50,000; 74,999]; 4: [75,000; 99,999]; 5: [100,000; 149,000]; 6: [150,000; 199,999]; 7: [≥200,000].

Age brackets. 1: [21; 25]; 2: [26; 34]; 3: [35; 54], 4: [55; 64], 5: [≥65] and over.

Wine Freq. 1: [daily]; 2: [2/3 per week]; 3: [once/week]; 4: [2/3 per month]; 5: [once per month]; 6: [less than once per month]; 7: [never].

habitual (at least once a week) wine consumers tend to be older and richer than nondrinkers and are slightly more likely to be female. Table 3 summarizes the level of participants' familiarity with the wine regions/varieties used in the experiment. Results confirm the a priori expectations guiding our experimental design (Table 1): Merlot and Cabernet are much better-known than Valdiguiè, Chambourcin, and Carignane; and California is a much more familiar wine-production region, despite the fact that we conducted the experiments in Colorado.

B. Tasting Scores and WTP

Table 4 presents the results obtained by estimating Models 1 and 2 via OLS with the overall acceptability (tasting score) of each wine as the dependent variable, which ranges from 1 to 5. Cluster robust standard errors are in parentheses. We analyze the data for habitual (at least once a week) wine consumers separately from the nonconsumers because perceptions and expectations, and therefore the effect of information, are likely to differ depending on previous experience. In presenting the results, we keep the focus on wine drinkers, as they are the most relevant population segment. Results for nondrinkers are not particularly insightful, but we report them for completeness.

Without regional information, average tasting scores (presented in the first two columns) show that participants rated California wines slightly higher than Colorado wines. This result obviously has limited external validity since the chosen wines are a convenience sample based on store availability. Turning to the

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Table 3
Familiarity with Wine Varietals (1–5 Scale) and Regions (1–4 Scale)

		Overall		*Drinkers*		*Nondrinkers*	
		Mean	*S.D.*	*Mean*	*S.D.*	*Mean*	*S.D.*
Variety*	Merlot	4.32	(.81)	4.33	(.77)	4.30	(.92)
	Cabernet	4.10	(.84)	4.09	(.72)	4.12	(1.11)
	Valdiguiè	1.39	(.95)	1.33	(.86)	1.57	(1.16)
	Chambourcin	1.57	(1.1)	1.47	(.99)	1.85	(1.33)
	Carignane	1.78	(1.34)	1.72	(1.32)	1.94	(1.38)
Region**	California	3.57	(.69)	3.64	(.7)	3.36	(.63)
	Colorado	2.75	(.87)	2.82	(.86)	2.56	(.87)

* 1: [never heard of it]; 2: [heard the name but never tasted]; 3: [tried it once]; 4: [tried it a few times]; 5: [consume routinely].

** 1: [never heard of wines produced in this region]; 2: [heard of wines produced in this region but never tasted them]; 3: [I have tasted wines produced in this region]; 4: [I consume wines produced in this region routinely].

effect of information, three out of four estimates have the expected negative sign, but only one in four tests (the Colorado Cabernet in the Boulder location) rejects the null hypothesis of "no stigma," with a reduction in tasting score of –0.29 (the p-values for each test are 0.41/2, 0.51/2, 1–0.64/2, and 0.08/2).[9] Somewhat intriguingly, the effect is reversed for nondrinkers, where the Colorado Cabernet in Boulder shows a positive and significant effect of information. However, we note that two significant results out of a total of 16 estimates are close to the expected number of false positives at a 10% significance level.

When we estimate a single parameter to measure the information effect on all Colorado wines (Model(3), results are in the rightmost part of Table 4), the estimate for wine drinkers decreases to an average of 0.11 in tasting scores, and the null hypothesis of no stigma is rejected (p = 0.20/2). The analogous parameter estimate for California wines is closer to zero and is nonsignificant. Table 4 also reports the estimated effect of regional information aggregated over unfamiliar (Chambourcin) vs. familiar (Merlot, Cabernet) varieties, with no evidence of systematic differences. In sum, it appears that there is a negative effect of information on sensory perceptions for Colorado wines, albeit rather small. For California, the aggregate effect of information is not statistically significant.

The left side of Table 5 reports parameters for Model (1), estimated via interval regression, again with cluster-robust standard errors in parentheses.[10] Absent region of production information, mean WTP for the sampled wines is between $6 and $8 per bottle. California wines generally elicited higher WTP than Colorado

[9] The p-values reported in Table 4 are for the standard (two-sided) significance tests and need to be divided by two for one-sided hypotheses.

[10] Including controls for the random frames and the compensation amount does not significantly alter our results, so we prefer the simpler model specification.

Table 4

Average Tasting Scores and Effects of Information

					Effect of Information					
			AVG. Score		*By Wine*		*Unknown vs. Known*		*Colorado vs. California*	
Prod. Region	*Varietal*	*Locat. (Order)*	*Drinker*	*Nondrinker*	*Drinker*	*Nondrinker*	*Drinker*	*Nondrinker*	*Drinker*	*Nondrinker*
Colorado	Chambourcin	Fort Collins (4)	3.36	3.13	–0.13	–0.17	–0.11	0.01	–0.11	0.15
			(.11)	(.21)	(.16)	(.3)	(.1)	(.2)	(.09)	(.13)
			0.00	0.00	0.41	0.57	0.29	0.96	0.20	0.25
Colorado	Charmbourcin	Boulder (1)	3.4	3.53	–0.09	0.14				
			(.11)	(.21)	(.14)	(.27)				
			0.00	0.00	0.51	0.61				
Colorado	Merlot	Fort Collins (2)	3.13	3.21	0.07	0.11	–0.11	0.3		
			(.12)	(.19)	(.16)	(.27)	(.11)	(.17)		
			0.00	0.00	0.65	0.68	0.33	0.09		
Colorado	Cabernet	Boulder (3)	3.4	2.63	–0.29	0.43				
			(.12)	(.16)	(.16)	(.23)				
			0.00	0.00	0.08	0.06				
California	Valdiguié	Fort Collins (3)	3.51	3.54	–0.17	0.03	–0.17	0.2	–0.05	0.16
			(.12)	(.23)	(.16)	(.3)	(.11)	(.2)	(.08)	(.12)
			0.00	0.00	0.29	0.91	0.13	0.33	0.53	0.19
California	Carignane	Boulder (2)	3.78	3.42	–0.16	0.32				
			(.12)	(.21)	(.15)	(.28)				
			0.00	0.00	0.29	0.25				
California	Merlot	Fort Collins (1)	3.36	3.59	0.26	0.07	0.06	0.12		
			(.1)	(.12)	(.13)	(.19)	(.1)	(.14)		
			0.00	0.00	0.05	0.71	0.52	0.40		
California	Cabernet	Boulder (4)	3.65	3.51	–0.12	0.16				
			(.12)	(.14)	(.15)	(.21)				
			0.00	0.00	0.42	0.45				

Habitual wine consumers, N*t = 236*4, vs. nondrinkers, N*t = 86*4, WITHOUT region of production information, and estimated score changes with region of production information (by wine, known vs. unknown varietal, and Colorado vs. California). Coefficient estimate, (standard errors), and p-values.

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Table 5
Average Willingness to Pay and Effects of Information

					Effect of Information					
			AVG. WTP		*By Wine*		*Unknown vs. Known*		*Colorado vs. California*	
Prod. Region	*Varietal*	*Locat. (Order)*	*Drinker*	*Nondrinker*	*Drinker*	*Nondrinker*	*Drinker*	*Nondrinker*	*Drinker*	*Nondrinker*
Colorado	Chambourcin	Fort Collins (4)	7.77	6.70	–1.17	–1.52	–1.10	–1.06	–1.19	–0.22
			(.79)	(1.08)	(.98)	(1.55)	(.65)	(1.35)	(.57)	(1.01)
			0.00	0.00	0.24	0.33	0.09	0.43	0.04	0.82
Colorado	Charmbourcin	Boulder (1)	6.56	7.9	–1.04	–0.73				
			(.61)	(1.61)	(.85)	(2.03)				
			0.00	0.00	0.22	0.72				
Colorado	Merlot	Fort Collins (2)	7.19	6.26	–1.02	–0.08	–1.28	0.61		
			(.7)	(.79)	(.93)	(1.26)	(.64)	(1.01)		
			0.00	0.00	0.27	0.95	0.05	0.54		
Colorado	Cabernet	Boulder (3)	6.29	5.23	–1.52	1.10				
			(.67)	(.81)	(.88)	(1.47)				
			0.00	0.00	0.08	0.46				
California	Valdiguié	Fort Collins (3)	8.64	6.52	–1.64	0.84	–1.57	1.92	–1.05	0.75
			(.88)	(1.24)	(1.1)	(1.74)	(.75)	(1.25)	(.63)	(1.07)
			0.00	0.00	0.14	0.63	0.04	0.12	0.10	0.49
California	Carignane	Boulder (2)	7.89	6.00	–1.49	2.69				
			(.76)	(.94)	(1.03)	(1.73)				
			0.00	0.00	0.15	0.12				
California	Merlot	Fort Collins (1)	7.08	7.73	0.68	–1.11	–0.53	–0.43		
			(.66)	(1.02)	(.94)	(1.41)	(.70)	(1.15)		
			0.00	0.00	0.47	0.43	0.45	0.71		
California	Cabernet	Boulder (4)	7.94	6.50	–1.66	0.05				
			(.78)	(1.14)	(1.01)	(1.69)				
			0.00	0.00	0.10	0.98				

Habitual wine consumers, N*t = 236*4, vs. nondrinkers, N*t = 86*4, WITHOUT region of production information, and estimated score changes with region of production information (by wine, known vs. unknown varietal, and Colorado vs. California). Coefficient estimate, (standard errors), and p-values.

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wines, which is consistent with the assessments recorded in the tasting experiment (Table 4). As one would expect, nondrinkers displayed lower WTP compared to habitual wine consumers, with two exceptions (Chambourcin-Boulder and Merlot-Fort Collins).

All estimates for the wine-specific information treatment effects (Table 5, right side) are negative and marginally close to significant (p-values are 0.24/2, 0.22/2, 0.27/2, and 0.08/2), with estimated discounts ranging between $1.02 and $1.52. Overall, the average treatment effect for Colorado wines (Model 2) is a discount of $1.10, and the null hypothesis of "no stigma" is strongly rejected (p = 0.04/2). Aggregate estimates for unknown vs. known wines (–$1.10 and –$1.28, respectively) are also significant, with no apparent difference between the two. These results seem to provide solid evidence in support of the stigmatized reputation and the reputation trap hypothesis.

What is puzzling, however, is that estimates for California wines are quite similar, even though standard errors are larger. Three out of four wine-specific estimates are negative, and the overall effect of information averaged over all California wines is –$1.05, a statistically significant result. One explanation for this unexpected result is that the difference in WTP we measured might be caused by confounding factors, specifically income. Indeed, the treated subsample is slightly less affluent than the untreated sample, which ostensibly may explain lower bids. To investigate, we re-estimated the WTP models and included controls for gender and household income (the two demographic variables displaying statistically significant differences). Results with these controls (see Appendix 1) and other specifications such as other demographic controls produced minimal changes, supporting a causal interpretation of the information treatment estimates.

C. Tail Analysis of the Information Effects

Having observed that region of production information lowers WTP for Colorado wines, one important question is whether this negative effect has any practical implications for wine producers. On the one hand, a decrease in mean WTP of more than a dollar is economically significant. On the other, the estimated mean WTP for Colorado wines is well below the observed retail market prices (in the $15 to $20 range for the wines we tested). This implies that only a fraction of the wine consumer population also contains potential Colorado wine buyers, which reflects the extreme competitiveness of the market. From a practical standpoint, what matters is whether information affects the consumers who are more likely to purchase the wines. Figure 1 shows a Kernel density plot[11] of the distribution of WTP with and without the region of origin information. Observing the tails, it is evident that the information treatment affected most prominently the right tail of the distribution, where the potential Colorado wine customers reside.

[11] To obtain the density, we discretized each WTP interval to its midpoint.

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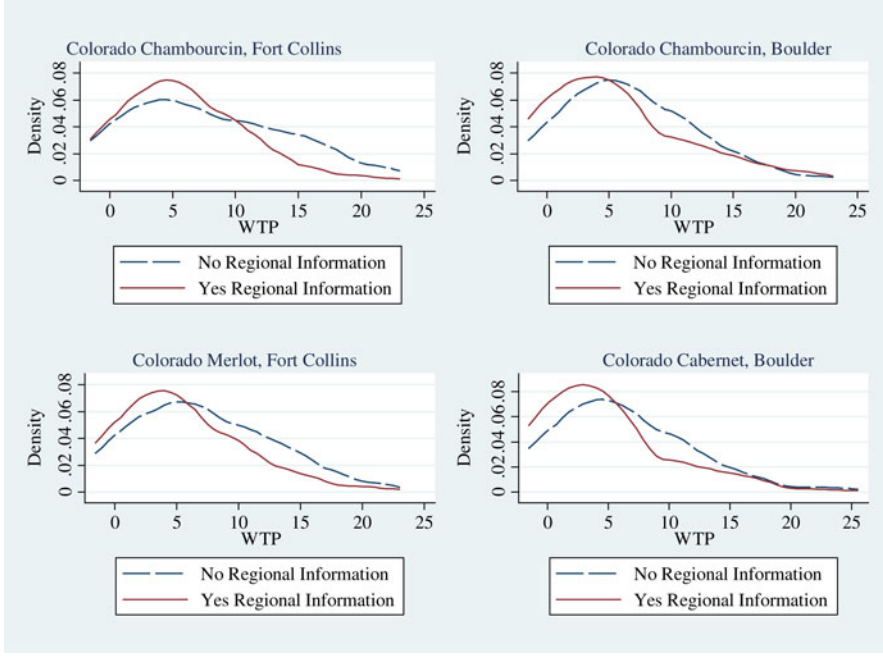
Figure 1

Kernel Density Estimates of High Frequency Wine Consumers' WTP for Colorado Wines with and without Regional Information



VI. Discussion and Policy Recommendations

We conducted an in-store test of the reputation trap hypothesis by measuring how the region of origin information changes sensory perceptions and WTP for Colorado wines. Our results are largely consistent with the presence of a stigma against Colorado-produced wine, even though some findings require further investigation. We found a statistically significant but rather small negative effect on taste ratings (–0.11, on a 1–5 scale, $p = 0.1$), while the effect is larger for WTP (\$–1.19, $p = 0.02$). All results are robust to the inclusion of demographic controls such as income and age. For the control California wines, we find no effect on taste, but WTP unexpectedly decreased (\$–1.05, $p = 0.1$) when we made regional information available, a result deserving further discussion. Having found no evidence of a confounding effect attributable to income, and given that participants were much more familiar with California than Colorado wines (see Table 3), our interpretation is that the negative effect observed for California wines might be due to the generic nature of the regional information we provided. The origin information in our experiments did not indicate the specific American Viticultural Area (e.g., Napa Valley, California), which consumers may expect to see with California wines. Typically,

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California wines not reporting AVA are cheaper, large volume, bulk wines, mixing grapes from multiple geographical areas. We speculate that this may have lowered expectations about the market price of the wine, especially in a store environment. Alternatively, participants may have displayed a home bias against California wines. For example, Li, McCluskey, and Messer (2018) find differentiated effects of information about water sourcing (conventional vs. recycled) on the WTP for California vs. French wines.

There is little doubt that liquor stores proved to be a difficult environment for Colorado wines. Very few participants in our experiment displayed a WTP above typical market prices. Even more concerning, regional information affected higher-WTP consumers the most, suggesting that the mass retail environment may be poorly suited for promoting new wine regions. Price and quality competition in retail stores is fierce, as the market is truly global. Consumers have access to worldwide wines, from the ancient European regions of production (France, Italy, and Spain) to rising New World stars (Australia, New Zealand, South Africa, Argentina, and Chile). This puts some wine regions at a disadvantage, as price competition is generally not feasible for small-scale producers, local messaging is ineffective (Loureiro, 2003), and stigma, as we found here, hinders quality perceptions.

That is not to say that nothing can be done. After all, California wines were often snubbed before proving themselves in the famous 1976 "Judgement of Paris" tasting competition (Taber, 2006). Of course, most novel U.S. wine regions are not endowed with the favorable growing conditions of the California valleys. The key, it seems, is to find a comparative advantage within a product niche, as Argentina did with Malbec and New Zealand did with Sauvignon Blanc. This is a long-term proposition, but our results indicate that stigma is not aggravated when presenting unfamiliar varieties, so there is no downside to experimenting with new varietals.

Wineries in nontraditional wine regions could also actively engage in avoiding or removing stigma. In the short term, a reasonable approach from a firm perspective is to focus on quality, build brand recognition, and avoid stigma by pursuing a decoupling strategy (Slade Shantz et al., 2018). Based on regulations from the Alcohol and Tobacco Tax and Trade Bureau (TTB),[12] an appellation of origin can be the name of a country, a state, a county, or an official American Viticultural Area, so there is no binding obligation to display state identifiers on a label. Indeed, we observed that several labels report the county or AVA information only, without mentioning Colorado. This strategy is moot when retailers display wine by region of production, but it may be useful when shelves are organized by variety.

Removing stigma is more complex. The literature distinguishes between core stigma, caused by some evident and enduring core attribute, and event-based stigma (Slade Shantz et al., 2018), which is linked to past performance. Stigma

[12] 27 CFR 4.25 see https://www.ttb.gov/appellations-of-origin.

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affecting nontraditional wine regions is most likely event-based in nature, which is easier to amend than core stigma. However, the market incentives motivating individual wineries to engage in costly actions to amend stigma are weak. As regional reputations are shared among all producers rather than owned by a single firm, individual wineries can do little to change the current state of affairs (Winfree and McCluskey, 2005). Costanigro, Bond, and McCluskey (2012) show that the presence of an industry leader (i.e., an affirmed regional firm brand of larger size) can help stimulate investment in collective reputation, but this is generally uncommon in nascent wine regions.

State industry associations, when present, are perhaps best positioned to remove stigma, but they have to strike a difficult balance. On the one hand, they are more motivated than individual firms to take proactive measures and change public perceptions. On the other, state-branded food marketing campaigns, similar to those supporting local agricultural products (Nganje, Hughner, and Lee, 2011), run the risk of being counterproductive in the presence of stigma. While we have no clear prescription to offer, the recent Bud Light campaign provides a curious example of creativity and what Slade Shantz et al. (2018) define as an "exploiting" strategy. Facing a stigmatized product category (mass-produced lager beer, see Barlow, Verhaal, and Hoskins (2018)), the brand embraced its common identity, poking fun at the sophisticated craft beer drinker.

The winery and the tasting room remain the most favorable places to sell local wine and counter stigma. In these environments, consumers are not just purchasing wine but a product bundled with an experience, and per-bottle margins tend to be higher (Barber, Donovan, and Dodd, 2008). Research has shown that the location/environment in which experiences occur can improve quality perceptions and WTP, and these effects are long-lasting (Pappalardo et al., 2019). Tourism activities, however, tend to be seasonal, so the potential to increase volume is limited. The easing of direct-to-consumer shipping laws[13] provides an opportunity to follow on-premises customers while bypassing liquor and grocery stores, but it requires an adequate online presence and intentional marketing efforts to promote brand loyalty.

VII. Limitations and Future Research

This study faced several limitations that should be considered when interpreting results, but the limitations also suggest new avenues for research. For one, we conducted the experiments in only two locations. This is common with experimental approaches, but care should be taken in extrapolating our results. The anomalous California result, and the hypothesis that state information without AVA lowers

[13] According to the Wine Institute, only five U.S. states currently restrict direct-to-consumer shipping from producing wineries. https://wineinstitute.compliancerules.org/state-map/

price expectations, should also be further investigated. This would require developing an experimental design including an AVA information treatment and its possible interaction with the absence/presence of state information.

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Appendix 1

Robustness Check
Replication of the Results from Table 5 with and without Demographic Controls

			AVG. WTP				*Effect of Information/Demographics*			
			Drinker		*Nondrinker*		*Drinker*		*Nondrinker*	
Prod. Region	*Varietal*	*Taste Locat. (Order)*	*No Control*	*Control*	*No Control*	*Control*	*No Control*	*Control*	*No Control*	*Control*
Colorado	Chambourcin	Fort Collins (4)	7.77	7.63	6.70	7.45	−1.17	−1.12	−1.52	−1.56
			(.79)	(1.16)	(1.08)	(1.83)	(.98)	(.99)	(1.55)	(1.6)
			0.00	0.00	0.00	0.00	0.24	0.25	0.33	0.33
Colorado	Charmbourcin	Boulder (1)	6.56	6.43	7.90	8.62	−1.04	−0.89	−0.73	−0.92
			(.61)	(.84)	(1.61)	(2.19)	(.85)	(.84)	(2.03)	(2.1)
			0.00	0.00	0.00	0.00	0.22	0.29	0.72	0.66
Colorado	Merlot	Fort Collins (2)	7.19	7.05	6.26	7.01	–1.02	–0.98	–0.08	–0.12
			(.7)	(1.11)	(.79)	(1.69)	(.93)	(.93)	(1.26)	(1.31)
			0.00	0.00	0.00	0.00	0.27	0.29	0.95	0.93
Colorado	Cabernet	Boulder (3)	6.29	6.16	5.23	5.82	–1.52	–1.36	1.10	1.03
			(.67)	(.87)	(.81)	(1.37)	(.88)	(.86)	(1.47)	(1.46)
			0.00	0.00	0.00	0.00	0.08	0.12	0.46	0.48
California	Valdiguié	Fort Collins (3)	8.64	8.50	6.52	7.26	–1.64	–1.60	0.84	0.80
			(.88)	(1.2)	(1.24)	(1.91)	(1.1)	(1.1)	(1.74)	(1.78)
			0.00	0.00	0.00	0.00	0.14	0.15	0.63	0.65
California	Carignane	Boulder (2)	7.89	7.76	6.00	6.63	–1.49	–1.34	2.69	2.58
			(.76)	(.93)	(.94)	(1.49)	(1.03)	(1.02)	(1.73)	(1.74)
			0.00	0.00	0.00	0.00	0.15	0.19	0.12	0.14
California	Merlot	Fort Collins (1)	7.08	6.93	7.73	8.48	0.68	0.72	–1.11	–1.14
			(.66)	(1.08)	(1.02)	(1.79)	(.94)	(.94)	(1.41)	(1.4)
			0.00	0.00	0.00	0.00	0.47	0.45	0.43	0.42

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Continued

			AVG. WTP				*Effect of Information/Demographics*			
			Drinker		*Nondrinker*		*Drinker*		*Nondrinker*	
Prod. Region	*Varietal*	*Taste Locat. (Order)*	*No Control*	*Control*	*No Control*	*Control*	*No Control*	*Control*	*No Control*	*Control*
California	Cabernet	Boulder (4)	7.94	7.81	6.50	7.16	–1.66	–1.50	0.05	–0.07
			(.78)	(.99)	(1.14)	(1.72)	(1.01)	(1.02)	(1.69)	(1.72)
			0.00	0.00	0.00	0.00	0.10	0.14	0.98	0.97
Demographic Controls										
Gender								–0.54		–1.12
								(.57)		(.96)
								0.34		0.24
Household income								0.10		–0.05
								0.17		0.32
								0.57		0.89

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